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SPECIFICATION FOR FENITROTHION DUSTING POWDERS

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Price *Rs* 4·00 *April* 1974

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SPECIFICATION FOR FENITROTHION DUSTING POWDERS

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AMENDMENT NO. 1 MAY 1994
TO
IS 7126 : 1973 SPECIFICATION FOR FENITROTHION DUSTING POWDERS

(*Page* 6, *clause* 4.1) — Substitute the following for the existing:

'When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 : 1983 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627 : 1983. However, the criteria for conformity of the material when tested, shall be the limits of tolerances, as applicable over the declared nominal value and given under clause 2.2.1 of the standard.'

(FAD 1)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR FENITROTHION DUSTING POWDERS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 December 1973, after the draft finalized by the Pest Control Sectional Committee had been approved by the Agricultural and Food Products Division Council and the Chemical Division Council.

0.2 Fenitrothion dusting powders are largely used in the control of pests of agricultural importance. This is specially effective against some of the pests of the rice crop and it is also useful in the control of certain acarine pests.

0.3 This standard is one of a series of Indian Standards on pesticides and their formulations. Other standards in this series are listed on page 10.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes requirements and methods of test for fenitrothion dusting powders containing varying percentages of fenitrothion, technical.

2. REQUIREMENTS

2.1 Description — The material shall be in the form of homogeneous powder. It shall be free-flowing and devoid of lumps; the fenitrothion used in its manufacture shall have been uniformly mixed in a suitable filler, such as talc, pyrophyllite, etc. The material, when dusted from a hand rotary duster, shall issue freely without clogging or bridging.

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*Rules for rounding off numerical values (*revised*).

2.1.1 Fenitrothion, technical employed in the manufacture of this material shall conform to IS : 5280-1969*.

2.2 The material shall comply with the requirements specified in Table 1.

TABLE 1 REQUIREMENTS FOR FENITROTHION DUSTING POWDERS

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Appendix	Cl No. of IS : 6940-1973*
(1)	(2)	(3)	(4)	(5)
i)	Fenitrothion content, percent by mass	Nominal value as declared on the container (*see* 2.2.1)	A	—
ii)	Sieving requirement, material passing through 75-micron IS Sieve†, percent by mass, *Min*	90	—	12.1
iii)	Bulk density after compacting	Not to exceed the value obtained before compacting by more than 60 percent	—	12.2
iv)	Acidity (as H_2SO_4), percent by mass, *Max*	0·1	—	11.3
	or			
	Alkalinity (as NaOH), percent by mass, *Max*	0·2	—	11.3

*Methods of test for pesticides and their formulations.

†*See* IS : 460-1962 ' Specification for test sieves (*revised*) '. BS sieve 200, ASTM test sieve 200, Tyler test sieve 200 have their apertures within the limits specified for 75-micron IS sieve.

---

*Specification for fenitrothion, technical.

2.2.1 The appropriate tolerances to be applied shall depend upon the declared nominal value of fenitrothion, technical (*see* Table 1) and they shall be as given below:

Nominal Value, Percent	*Tolerance Limits, Percent*	
Up to 10	+ 10 − 5	of the nominal value
Above 10 and up to 50	± 5	
Above 50	+ 5 − 3	

2.2.1.1 The actual value of the technical material in the formulation shall be calculated to the second decimal place for rounding off the first decimal place before applying the tolerance as stipulated in **2.2.1**.

3. PACKING AND MARKING

3.1 Packing — The material shall be packed in clean and dry containers made of mild steel with a polyethylene liner; tinplate internally coated with a corrosion-resistant lacquer; polyethylene lined fibreboard or wooden containers; or hessian bags polyethylene lined or bituminized.

3.2 Marking — The containers shall be securely closed and shall bear legibly and indelibly the following information and any other requirements as per the Insecticides Rules:

a) Name of the material;
b) Name of the manufacturer;
c) Date of manufacture;
d) Batch number;
e) Net mass of contents;
f) Nominal fenitrothion content, percent by mass; and
g) The minimum cautionary notice worded as under:

> 'HIGHLY POISONOUS. HANDLE WITH CARE. KEEP AWAY FROM FOODSTUFFS AND ANIMAL FEEDS. DO NOT TOUCH OR INHALE THE CONTENTS. WHILE HANDLING THE CONTENTS, USE RUBBER GLOVES AND FACE MASK. USE OF EMPTY CONTAINERS DANGEROUS. IN CASE OF POISONING, CALL A PHYSICIAN. ATROPINE AND OXYGEN ARE USEFUL IN TREATMENT.'

3.2.1 When hessian bags are used for packing this material, the pictorial marking for ' USE NO HOOKS. DO NOT PUNCTURE ', as contained in IS : 1286-1973*, shall be stencilled on the bags.

3.2.2 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4. SAMPLING

4.1 Representative samples of the material shall be drawn as prescribed in the ' Indian Standard methods of sampling for pesticides and their formulations (*under preparation*) '.

5. TESTS

5.1 Tests shall be carried out as prescribed in the appropriate appendix and clauses given in col 4 and 5 of Table 1.

5.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1960†) shall be employed in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

APPENDIX A

[*Table* 1, *Item* (i)]

DETERMINATION OF FENITROTHION CONTENT

A-0. PRINCIPLE OF THE METHOD

A-0.1 The sample is dissolved in ether and the most likely impurity, 4-nitro-*m*-cresol, is extracted with mild alkali. The ether layer is treated with zinc and an acetic acid-hydrochloric acid mixture and the amine groups formed are titrated with standard sodium nitrite solution.

---

*Pictorial markings for handling of goods in general (*second revision*).

†Specification for water, distilled quality (*revised*).

A-1. REAGENTS

A-1.1 Acetic Acid-Hydrochloric Acid Mixtures — Mix 9 volumes of glacial acetic acid with 1 volume of concentrated hydrochloric acid.

A-1.2 Standard Sodium Nitrite Solution — 0·1 M, standardized against sulphanilic acid. Dissolve 6·90 g of sodium nitrite in distilled water and make up to one litre with distilled water. Standardize as follows:

> Weigh accurately 0·40 to 0·45 g of anhydrous sulphanilic acid analytical grade into a 400-ml tall-form beaker. Add 80 ml of distilled water, 10 ml of concentrated hydrochloric acid, 30 ml of glacial acetic acid and 5 g of sodium (or potassium) bromide. Cool the mixture to 0 to 10°C by the addition of clean, shaved ice and stir mechanically. Titrate at 0 to 10°C with the 0·1 M sodium nitrite as rapidly as the spot test permits. Near the end-point, add the sodium nitrite in four-drop portions.

$$\text{Normality of } 0{\cdot}1 \text{ M sodium nitrite} = \frac{a \times 5{\cdot}774}{b}$$

where

a = mass in g of sulphanilic acid used, and

b = volume in ml of 0·1 M sodium nitrite required.

A-3. PROCEDURE

A-3.1 Extraction of Free 4-Nitro-*m*-Cresol — Weigh accurately sufficient quantity of the material containing 1 g of fenitrothion in a 250-ml beaker. Add 70 ml of ether and agitate for 5 minutes and filter through a fritted-glass crucible. Wash the flask and the residue in the crucible with portions of ether to extract fenitrothion completely. Reduce the volume to about 50 ml and transfer it to separating funnel with 100 ml ether in two lots. Extract the ether solution four times with 20-ml portions of chilled 1 percent *m/v* solution of sodium carbonate. Dry ether phase with 2 to 3 g of anhydrous sodium sulphate. Extraction should be as rapid as possible to prevent degradation of the active principle.

A-3.2 Determination of Active Ingredient — Transfer the ether layer quantitatively to a 500-ml flask using small portion of ether. Distil off ether in a steam-bath till only the residue is left at the bottom of the flask. Add 100 ml of acetic acid-hydrochloric acid mixture and 10 g iron-free zinc dust to the residue and heat gently on a steam-bath till the solution is colourless. Add 25 ml of concentrated hydrochloric acid and 75 ml of distilled water to complete the solution of the zinc dust. Cool, wash down the beaker and watch glass with distilled water and add 5 g of sodium (or potassium) bromide. Cool the mixture to 0 to 10°C by the addition of clean shaved ice and stir mechanically. Titrate at 0 to 10°C with the standardized 0·1 M sodium nitrite as rapidly as the spot test permits. Near the end-point add the sodium nitrite in four-drop portions.

A-3.3 Spot Test — Dip a glass rod into the solution to be tested and then touch the rod quickly to a piece of potassium iodide-starch paper. The end-point is reached when an intense blue-black colour appears immediately and is obtained repeatedly during a one-minute period without further addition of sodium nitrite.

A-4. CALCULATION

A-4.1 Fenitrothion content, percent by mass $= \frac{27{\cdot}72\, WNf}{w}$

where

W = volume (in ml) of 0·1 M sodium nitrite required;

N = normality of the 0·1 M sodium nitrite;

f = correction factor $\frac{T}{A}$;

T = volume in ml of 0·1 M sodium nitrite calculated for the nitro-group determination of 1 g of a mononitro reference material;

A = volume in ml of 0·1 M sodium nitrite used in the nitrogroup determination of 1 g of a recrystallized sample of the same substance, following the method described above and using the same reagents; and

w = mass in g of sample.

NOTE — The correction factor f is intended to allow for errors due to impurities in reagents, as well as those inherent in the method itself or in its application by a given laboratory. Its value shall lie within the range 0·98 to 1·02.

INDIAN STANDARDS
ON
PESTICIDES (DUSTING POWDERS)

IS:	
561-1972	BHC (HCH) dusting powders (*third revision*)
564-1961	DDT dusting powders (*revised*)
1308-1958	Aldrin dusting powders
1506-1967	Copper oxychloride dusting powders (*first revision*)
1669-1960	Cuprous oxide dusting powders
2568-1973	Malathion dusting powders (*first revision*)
2864-1964	Chlordane dusting powders
4322-1967	Endosulfan dusting powders
6178-1971	Pyrethrum dusting powders
6429-1972	Heptachlor dusting powders
6444-1972	Sulphur dusting powder

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Printed at Caslon Press, New Delhi, India